1000 SERIES
PORTABLE PRINTER
USER MANUAL

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INTRODUCTION

The 1000 series is a range of portable, battery powered printers available in three basic models.

1009.0XXX - 42 Cols @ 1.0 lines/second.

1012.0XXX - 24 Cols @ 2.5 lines/second.

1014.0XXX - 40 Cols @ 1.7 lines/second.

The manual has been divided into three sections for ease of reference.

Part 1 deals with printer installation. Part 2 with general operation : paper loading, ribbon changing. Part 3 is for programmers.

By following the guide lines in this manual and with careful handling, a long and reliable operating life can be expected from these printers.

Please note that the printers are despatched from the factory with no charge in the batteries for safety and storage reasons. Refer to section 3.5 for power supply details.

FEATURES

- Easy paper loading and ribbon replacement.
- Clearly defined switch panel.
- Serial RS232/Centronics Parallel option.
- One hour continuous printing with fully charged batteries.
- International Character set.
- Automatic power-off features.
- User selectable options stored in non-volatile RAM.
- Head jam protection - power to the print head and carriage motor is switched off to prevent damage in the event of a head jam.
- Full 96 ASCII character set (plus additional European and scientific characters).
- One line buffer.
- Double width printing.
- Double height printing.
- Underlining.
- Built-in tab stops.
- Vertical tab.
- Form feed.
- Self-test facility.
- Inverted Printing. (Data Mode)
- Graphics.
- Reset command.
- Epson ESC/POS Emulation.
- Citizen 560 Emulation.
- Diagnostic Mode

PART 1 INSTALLATION

1.1 Precautions

(1) The printer is to be used free-standing and should be placed on a stable surface providing easy access to the control panel and to the paper well when the lid is open.

(2) Do not site the printer in an excessively hot or humid location. Exposure to grease, dust, metal swarf or liquids is best avoided.

(3) When using the power adapter avoid using a mains outlet which also supplies heavy switching machinery since a noisy supply may impair printer operation.

(4) Ensure that the adapter provides the correct operating voltage. Refer to section 3.5 for supply details.

(5) Care must be taken to ensure that any power adapter supplied by the customer meets with national safety requirements and has the correct output voltage and polarity. The manufacturer has no responsibility for equipment operating outside these parameters.

(6) Do not remove paper by pulling it from the back of the mechanism and do not pull excessive lengths through the top of the mechanism. Either of these operations may cause paper to tear and jam the mechanism.

1.2 Default Settings

The 1000 printer is supplied with the following default settings:

Data/Parity	8/None
Xon/Xoff	On
Parity	None (Not shown for Parallel Interface)
Baud Rate	9600 (Not shown for Parallel Interface)
Character Set	UK
Print Mode	Text
Auto-Off	5 minutes
Emulation	Standard
DTR	Normal
Interface	Serial or Parallel
Mechanism	As applicable

Default settings can be restored by pressing both the feed and programme switches together at power up. Releasing the feed button before the programme button will set original defaults.

See section 1.5 to change the above parameters.

1.3 Self-Test

To perform a self-test press the power “ON” and “FEED” switch simultaneously and keep them depressed until the test starts. This will check all the mechanics, and a large proportion of the software and hardware without the need for connection to a host. The software issue is printed in double height, double width text, followed by the character set in normal text. Below this are listed the current settings of the user selectable options. If the settings are correct for your host,

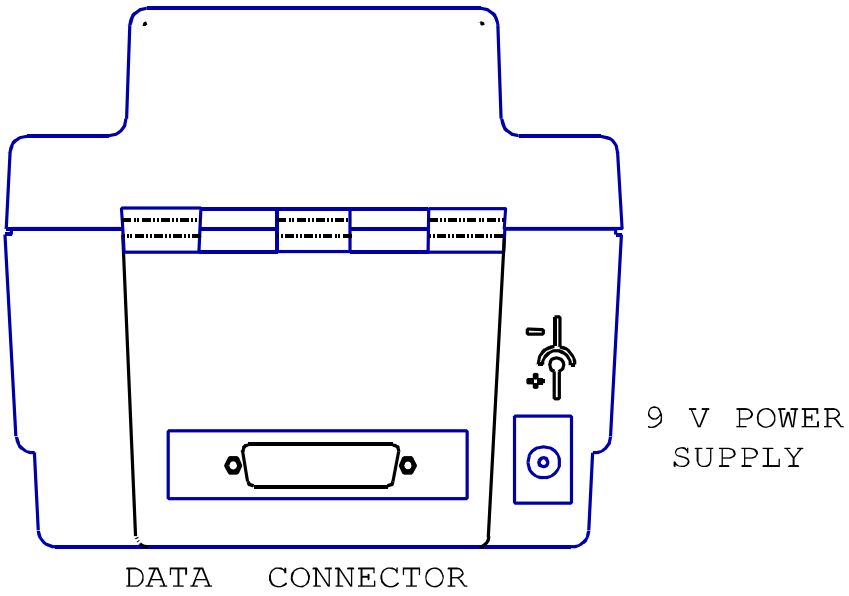
you are ready to connect the printer to your system. Otherwise you will need to reprogramme the printer as described in section 1.5. The self test will be repeated until the power is switched off. Normal operation is resumed after power-on.

Note: The parity and baud rate settings are not printed on the parallel version.

1.4 Interface Connections

The 1000 printers are available with a Centronics Parallel or RS232 Serial interface. The interface type is printed on the self-test slip.

The connector is a 25 way D plug for Parallel and a 25 way D socket for Serial.



PARALLEL CONNECTIONS - TTL LEVELS

Function	25 Way D-Plug	Input/Output
$\overline{\text{Strobe}}$	1	IN
D0	2	IN
D1	3	IN
D2	4	IN
D3	5	IN
D4	6	IN
D5	7	IN
D6	8	IN
D7	9	IN
$\overline{\text{Ack}}$	10	OUT
Busy	11	OUT
P End	12	OUT
Select	13 (+5V via 100K)	OUT
Auto Feed	14 (NC)	-
$\overline{\text{Error}}$	15 (+5V via 100K)	OUT
Initialise Printer	16 (NC)	-
Select Input	17 (NC)	-
GND	18 - 25	-

SERIAL CONNECTIONS - RS232

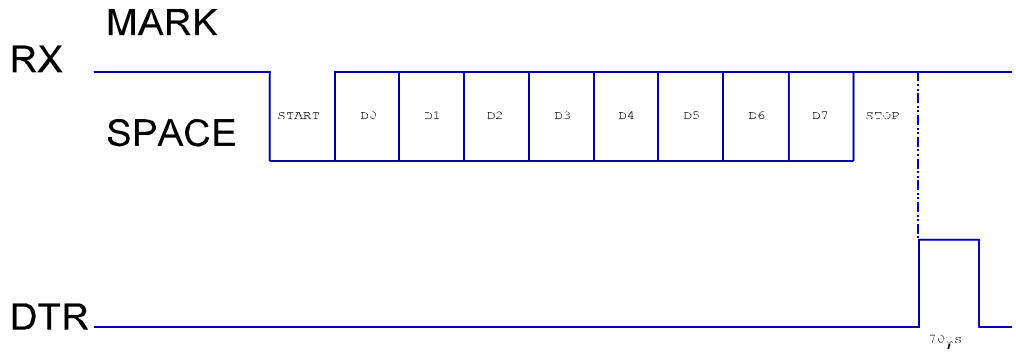
Function	25 Way D Socket	Input/Output
RX	3	IN
TX	2	OUT
CTS	5	IN
DTR	20	OUT
GND	7	-
NC	6, 8-19, 21-25	-
FG	1	
RTS	4 (+10V via 1K)	OUT

Note that on some models, internal links have been factory set in order to allow power input via the serial D25. In these instances power will either be on:

pins 8, 9: GND	OR	pins 14,15: GND
pins 12,13: power in		pins 16,17: power in

in either case a grommet must be present in the normal power jack input to prevent a short in the supply and protect against static discharge. Such models are supplied with the grommet fitted and it should never be removed.

1000 SERIAL INTERFACE TIMING



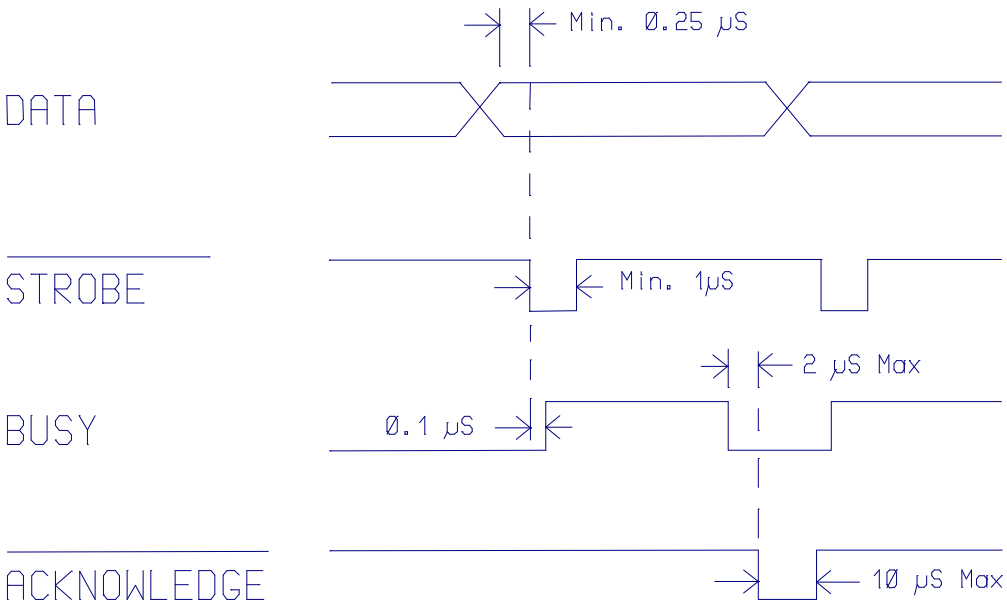
MARK = -8V

SPACE = +8V

N.B : DTR WILL BE SET FOR A MINIMUM OF 70µs AT THE END OF THE STOP BIT ON EACH CHARACTER.

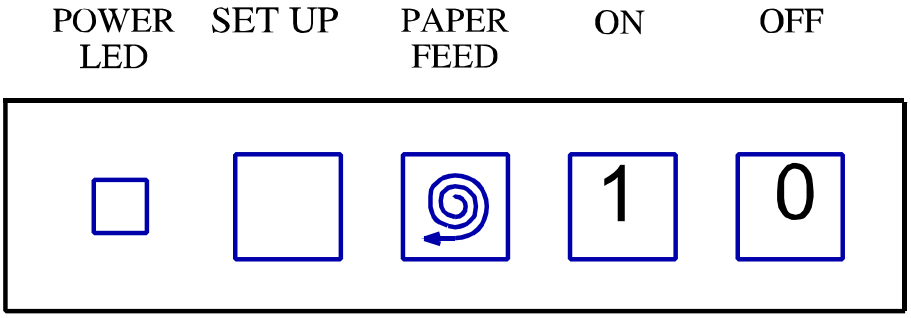
THIS CONDITION WILL BE LONGER FOR BUFFER FULL AND WILL BE SET UNTIL RESET IF A PRINTER FAULT OCCURS.

1000 PARALLEL INTERFACE TIMING



1.5 Programme Mode

On the front of the unit there is a power-on indicator and four switches which are labelled as shown below.



If the programme (set-up) switch is pressed at power up (i.e. programme switch and power-on switch together) then the printer will go into set-up mode and print the current parameter status. Example : Number of data bits : 8 bit data.

The power-on indicator will flash every second to indicate programme mode.

Each time the feed switch is pressed and released the next printer parameter is printed. Pressing the programme switch will cause the status of that parameter to change in the sequence shown. Each status table rotates so 300 baud follows on from 19200 baud and so on.

Once the correct status has been selected then both the programme switch and the feed switch should be pressed simultaneously to update the printer's status. Note that this need only be done when all parameters that need changing have been selected. If no switches are pressed for 15 seconds the set-up mode is automatically terminated without changing the original parameters.

Parameter (FEED Switch)		Status (PROGRAMME Switch)	
(1)	Data bits/Parity	8 bit data/No Parity 7 bit data/Odd Parity 7 bit data/Even Parity	
(2)	*Xon/Xoff	Off On	
(3)	*Serial Baud Rate	300 baud 600 baud 1200 baud 2400 baud 4800 baud 9600 baud 19200 baud	
(4)	Character Set	USA FRANCE GERMANY ENGLAND DENMARK I SWEDEN	ITALY SPAIN JAPAN NORWAY DENMARK II
(5)	Print Mode	TEXT (Normal Print) DATA (Inverted Print)	
(6)	Auto POWER OFF	5 minutes 1 minute Disabled	
(7)	Emulation	Standard Citizen 560 ESC/POS	
(8)	DTR	Normal Inverted	

***** **Not printed for a parallel interface**

An alternative method is to send the "set up" data via the RS232 port to prevent the need for manual programming.

Setup via Data Interface

If the 1000 is turned on whilst both the programme and feed switches are pressed and only the programme switch is released, the 1000 will print:-

"NVR COMMS READY>"

At this point the printer is waiting to receive data in the following format:-

"PROGMODE" + CARRIAGE RETURN + n1 + ...n10 (n1 to n10 are hex numbers)

The "PROGMODE" followed by a carriage return indicates that the printer should expect parameter data as shown in Table 1 below.

Note: The data sent to reprogramme the printer is always expected at 9600 baud, 8 data bits, no parity, irrespective of any of the existing printer settings.

Upon receiving information in the correct format the 1000 will print:-

"DATA OK, NVR UPDATED!"

If the data received is not in the correct format then the 1000 will print:-

"DATA ERROR NVR UNCHANGED"

Note: If no data is received within 15 seconds or the feed key is released before the procedure is complete, then the change of parameters will not take place and the 1000 will print:-

"SET ERROR NVR UNCHANGED"

TABLE 1

n	Value 6 Description 9	0	1	2	3	4	5	6	7	8	9	10
1	Data/Parity	8/None	7/Odd	7/Even								
2	Xon/Xoff	Off	On									
3	Baud Rate	19200	9600	4800	2400	1200	600	300				
4	Country	Denmark 2	Norway	Japan	Spain	Italy	Sweden	Denmark 1	U.K.	Germany	France	U.S.A.
5	Print Mode	Data	Text									
6	Auto Off	Disabled	1 Minute	5 Minute								
7	Emulation	ESCPOS	560	Standard								
8	DTR	Inverted	Normal									
9	Zero Status	O	i									
10	Reserved for future use - A zero value must be sent with present firmware											

String "PROGRAMME-MODE", 0DH,n_1,n_2,n_3,n_4,n_5,n_6,n_7,n_8,n_9,n_{10}

SAMPLE PROGRAMME IN BASIC

```
10      KEY OFF:CLS:
15      LOCATE 2,25:PRINT "NVR TEST ROUTINE FOR 1000";
16      LOCATE 3,25:PRINT "-------------------------";
20      LOCATE 5,25:INPUT "(S)erial or (P)arallel ?",A$
30      IF A$="S" OR A$= "s" THEN 60
40      IF A$="P" OR A$= "p" THEN 50
45      GOTO 10
50      WIDTH "lpt1:",255:OPEN "lpt1:" AS #1:GOTO 65
60      OPEN "COM1:9600,N,8,1,RS,CSO,DS65535" AS #1
65      LOCATE 7,5:INPUT "Press prog+feed, power on, release prog on 1000, then press
        any key ...";B$
70      PRINT #1,"PROGMODE";CHR$(13);
80      FOR I=1 TO 10:READ A:PRINT #1,CHR$(A);:NEXT I
90      RESTORE
100     PRINT #1,CHR$(13);CHR$(13)
110     CLOSE #1
120     DATA 0,1,2,9,0,1,1,1,1,0
```

The programme sets: 8 data/No parity, Xon/Xoff, 4800 baud, France, Data mode, 1 min., 560, NORMAL DTR, zero with a "slash" across it.

Note that the factory defaults can always be restored by pressing both the feed and programme switches at power up then releasing only the Feed switch. Defaults will be restored and a printed message acknowledges that this has occurred.

1.6 Troubleshooting

(1) The power light does not come on when the unit is switched on.

Check the batteries are sufficiently charged or that the power adapter is connected correctly. If the power resource is satisfactory and the LED still does not illuminate when the power is switched on, refer the unit for repair.

(2) The power light comes on but the printer does not feed paper.

This is a head jam condition. Check that there is no paper jammed in the mechanism.

(3) The paper is not feeding properly.

If the print looks squashed, check that the paper roll is sitting correctly in the paper well and that the roll is the right way up. The paper should be feeding off the bottom of the roll into the back of the mechanism, NOT off the top of the roll. Remove paper and reload if necessary.

(4) No print on the paper.

If the printer is working but no print is visible, check that the ribbon is present and not excessively worn and that it is freely moving round the cartridge. Wind the ribbon on manually then feed paper while the lid is open to check the cassette knob is rotating. Also check that the ribbon has been fitted correctly and that the exposed ribbon is in front of the paper.

(5) The printer does self-test but does not print data sent through the interface.

Check interface connections are correct. (See section 1.4).

(6) The printer prints '*' in place of the transmitted characters or it does not action commands.

Check handshaking line, parity setting and baud-rate.

If a command is not carried out by the printer, it is possible to check for an incorrect control code or character by initiating diagnostic mode.

Diagnostic Mode reveals control codes and characters sent to the printer. Characters 00H to 1FH are translated to characters 40H to 5FH and underlined to indicate a control character.

EXAMPLE: HORIZONTAL TAB (O9H) = CTRL I Printed as I
CARRIAGE RETURN (ODH)= CTRL M Printed as M

Normal characters are not underlined.

1.61 Diagnostic Mode

To enter diagnostic mode initiate self-test and keep the feed switch depressed until 'DIAGNOSTIC MODE' is printed. The power-on indicator will flash every two seconds.

An example of diagnostic mode is as follows :

ABC	DE FG	...	Normal Print
	ABCIDE UFXGM	...	Diagnostic Print Out

In the example the following sequence of characters was sent:

Characters ABC, horizontal tab (I), characters DE, space, underline (U) character F, release underline (X) character G, carriage return (M).

A list of valid control characters is shown in section 3.2.

To reveal the complete information sent, press the feed switch. To terminate diagnostic mode, switch off and on again to resume normal operation.

1.7 Accessories

Paper Specification: **NOTE: Paper must not be stuck to the core.**

Wood free white paper.

Dimensions: 57.5mm ± 0.5mm (width)
60mm max (Roll diameter)

Paper Thickness: 85 microns

Ribbon Specification:

Colour: Purple (Black optional)

Epson Part No: ERC-09

Refer to Appendix 3 for the power adapter specification.

If a power adapter is to be sourced from another supplier make sure that it complies with the specification in Appendix 3.

PART 2 OPERATOR'S GUIDE

Operation

- **DO** read the operating instructions carefully before you attempt to use the printer.

- **DO** ensure that any electrical connections are properly made in accordance with the instructions.

- **DO NOT** remove any fixed covers unless you are qualified to do so - and even then switch off first and disconnect the power adapter from the socket before you start.

- **DO NOT** continue to operate the printer if you have any doubt about it working normally, or if it is damaged in any way. Refer the unit for repair.

2.1 Power-On Procedure

Check the batteries are sufficiently charged or that the power adapter is connected correctly.

Open the lid and check that paper and ribbon are present and that there are no foreign objects inside the paper well or mechanism.

Close the lid, ensuring the paper is guided out through the paper exit slot.

Switch on the printer by pressing the symbol marked '1' on the switch panel.

The power-on indicator will light and the mechanism will reset. If this does not happen refer to section 1.6.

2.2 Paper Loading

If the paper roll needs replacing adhere to the following procedure.

Open the lid and remove the old paper, taking care not to pull the paper out of the back of the mechanism. Press the feed switch until any excess paper left in the mechanism is fed out.

Reel off a few centimetres from a new paper roll and ensure that the paper end is square.

Sit the roll in the paper well with the paper end coming from the bottom of the roll.

Offer the paper into the back of the mechanism and press the feed switch. Keep the switch depressed until enough paper is fed through the mechanism to be inserted through the paper exit slot.

Feed the paper through the exit slot and close the lid.

2.3 Ribbon Change

Ensure the power is off and open the lid. The legend on the cassette gives an instruction (PUSH) to remove the old ribbon. The cassette will clip off one side and can easily be removed.

Take a new ribbon and check it is taut. Clip it into position making sure that the paper protruding from the top of the mechanism is located between the exposed ribbon and the plastic cassette. Wind the knob a few turns in the direction shown on the cassette to take up any slack in the ribbon.

Close the lid.

2.4 Paper Feed

Check the power is on.

For a single line paper feed, press and release the "Feed" switch. For continuous line feed keep the switch depressed.

NOTE: The power indicator will turn off when the feed switch is depressed.

2.5 Care Of the Printer

Periodic cleaning will help to keep your printer in good condition.

IMPORTANT: Switch the printer off and disconnect the power adapter before any cleaning operation.

Use a soft brush to remove any dust or foreign particles from the paper well and mechanism. The case may be cleaned with a soft cloth slightly dampened with alcohol. Be careful not to let any liquid enter the printer enclosure.

Do not use the printer if liquid or metal objects have entered the unit. If this happens whilst the printer is in use, switch off immediately and have it serviced.

If the printer is not going to be used for some time disconnect the power adapter and ensure the unit is switched off.

Do not continue printing with a worn ribbon, since this will eventually fray and may damage the print head.

Do not leave the printer powered up if it is malfunctioning.

NOTE: To conserve the battery power ensure that the unit is set at 1 or 5 minute auto off. (See section 1.5)

PART 3 PROGRAMMING

3.1 Command Summary For The 1000 Printer

Function	Keystroke	Hex	Decimal
Horizontal Tab	CTRL I	09H	9
Line Feed	CTRL J	0AH	10
Form Feed	CTRL K	0BH	11
Vertical Tab	CTRL L, n	0CH, n	12,n
Carriage Return	CTRL M	0DH	13
Double Width	CTRL N	0EH	14
Single Width	CTRL O	0FH	15
Reset	CTRL Q	11H	17
Underline	CTRL U	15H	21
Underline Release	CTRL X	18H	24
Reverse Print	CTRL Y	19H	25
Double Height	CTRL Z	1AH	26
Graphics	CTRL [, n	1BH, n	27,n

Command Summary For Epson ESC/POS Emulation

Horizontal Tab	CTRL I	09H	9
Line Feed	CTRL J	0AH	10
Form Feed	CTRL L	0CH	12
Carriage Return	CTRL M	0DH	13
Set Print Mode	ESC !,n	1BH, 21H, n	27,33,n
Initialise Printer	ESC @	1BH, 40H	27,64
Character Set	ESC R,n	1BH, 52H, n	27,82,n
Print & Feed	ESC d,n	1BH, 64H, n	27,100,n
Status Request	ESC v	1BH, 76H	27,118
Inverted Printing	ESC {,n	1BH, 7BH, n	27,123,n
Set form length	ESC C,n	1BH, 43H, n	27,67,n

Command Summary For Citizen 560 Emulation

Line Feed	CTRL J	0AH	10	
Form Feed	CTRL L	0CH	12	
Carriage Return	CTRL M	0DH	13	
Reverse Print	CTRL T	14H	20	
Clear Buffer	CTRL X	18H	24	_____
Graphic Print	ESC K	1BH, 4BH*	27,75	* Commands
Page length/format	ESC C	1BH, 43H*	27,67	acknowledged
Paging Is Off	ESC O	1BH, 4FH*	27,79	but not
2.75 mm Spacing	ESC 1	1BH, 31H*	27,49	executed.
5.5 mm Spacing	ESC 2	1BH, 32H*	27,50	_____
Double Width	-	1EH	30	
Single Width	-	1FH	31	

3.2 Command Description For The 1000 Printer

TAB (09H) Tab stops occur at every 8th column. On receipt of this command, spaces are entered into the line up to the next tab stop.

LINE FEED (0AH) Prints the current line and feeds one line. If LF and CR are sent, the CR is ignored to avoid a double feed.

FORM FEED (0BH) Will feed 4 fast line feeds.

VERTICAL TAB (0CH,n) Fast feeds the paper by n lines where n is a single byte hex number in the range $0 < n < 63$. Note that a vertical tab will print the contents of the line buffer before being executed.

CR (0DH) Prints the current line and feeds one line. If CR and LF are sent, the LF is ignored to avoid a double feed.

On the receipt of the last printable character (e.g. 24 characters for the 1012), the printer will automatically print the data in the buffer. If CR and LF are sent after this condition, they will be ignored.

DOUBLE WIDTH (0EH) Turns double width printing on. This state continues until terminated by the single width command or completion of the current line.

If the last character in the line buffer is double width, but there is only room for a single width character, then it will be printed in single width.

SINGLE WIDTH (0FH) Reverts to single width printing. Single and double width can be combined anywhere on a line.

RESET (11H) Causes printer status reset. Printer status is set to single width, normal height, no underline. Note that the buffer remains unaltered to avoid any data loss.

UNDERLINE (15H) Characters sent after this command will be underlined. Tabs are not underlined. Underlining is terminated by the U/L release command or on completion of the current line.

U/L RELEASE (18H) Terminates underlining.

REVERSE PRINT(19H) This command sets the print to white on black. The command will toggle between reverse and normal print wherever it appears on a line, but the condition is always reset at the end of the line.

DOUBLE HEIGHT (1AH) Prints the line in double height for one line only. Double height and single height cannot be mixed on the same line.

GRAPHICS (1BH,n) Graphics command to enter bit image printing. The number of graphic bytes sent will depend on the type of printer. (eg 24 for a 1012, 40 for a 1014.) For each graphic byte sent, 6 bits out of 8 are used to build the graphics string (LSB as the right most dot) and 'n' is the number of times the string sent will be repeated for a repetitive pattern. The value of 'n' is limited to a maximum of 63 lines. The print buffer will be printed first if not empty.

Examples:

To repeat a string of data bytes, d1....d24 over two rows with a 1012 printer, send : 1BH, 02H, d1....d24.

For a non-repeated string send : 1BH, 01H, d1....d24.

3.3 Epson ESC/POS Command Description

TAB (09H)

Tab stops occur at every 8th column. On receipt of this command, spaces are entered into the line up to the next tab stop.

LINE FEED (0AH)

Prints the current line and feeds one line. If LF and CR are sent, the CR is ignored to avoid a double feed.

FORM FEED (0CH)

Prints the current line and feeds the number of lines determined by using the ESC C command.

CR (0DH)

Prints the current line and feeds one line. If CR and LF are sent, the LF is ignored to avoid a double feed.

ESC ! n (1BH,21H,n)

Sets the print mode according to the following table and n is a single byte in which each bit sets the printing function. Note that underlines cannot be used with a horizontal tab and any combination of double height and width can be used. Double and single height cannot be mixed on a line, however, whereas double and single width can be mixed anywhere on a line. Default is n = 0.

Bit	Function	Value	
		0	1
0	Character font	5 x 7 font	5 x 7 font
1	Undefined		
2	Undefined		
3	Undefined		
4	Double-height	Cancelled	Set
5	Double-width	Cancelled	Set
6	Undefined		
7	Underline	Cancelled	Set

ESC @ (1BH,40H)

Initialise printer. Clears the print buffer and resets the printer mode to default values.

ESC R n (1BH,52H,n) Selects an international character set from the following table determined by the value of n. The default value is the character set programmed in the printer.

n	Country
0	U.S.A.
1	France
2	Germany
3	U.K.
4	Denmark 1
5	Sweden
6	Italy
7	Spain
8	Japan
9	Norway
10	Denmark 11

ESC d n (1B,64H,n) Prints the data in the print buffer and performs n line feeds.

ESC v (1BH,76H) Status request. The current printer status is transmitted to the host computer on receipt of this command. It takes the form of a single byte which is fixed at 0 (to indicate paper in) for the 1000 printer. The byte is sent regardless of the CTS handshaking signal.

ESC { n (1BH,7BH,n) Inverted print command. When n = 1 then print is inverted and text will be printed from right to left. For normal print n = 0. The default mode is set by the programmed parameters in the printer.

ESC C n (1BH,43H,n) Set form length. When used in conjunction with the form feed command (0CH), the printer will feed n lines. Note that if n = 0 then there will be no line feeds. The default value is n = 0.

3.4 Command Description For The 1000 Printer With 560 Emulation

LINE FEED (0AH) Prints the current line and feeds one line. If LF and CR are sent, the CR is ignored to avoid a double feed.

FORM FEED (0CH) Will feed 4 fast line feeds.

CR (0DH) Prints the current line and feeds one line. If CR and LF are sent, the LF is ignored to avoid a double feed.

On the receipt of the last printable character (eg 24 characters for the 1012), the printer will automatically print the data in the buffer. If CR and LF are sent after this condition, they will be ignored.

REVERSE PRINT (14H) This command sets the print to white on black. The command will toggle between reverse and normal print wherever it appears on a line but the condition is always reset at the end of the line.

CLEAR BUFFER (18H) Clears the print data in the buffer. All the previous input data is cleared with this code. However, in the case of graphic print mode, this code is treated as data.

DOUBLE WIDTH (1EH) Turns double width printing on. This state continues until terminated by the single width command or completion of the current line.

If the last character in the line buffer is double width, but there is only room for a single width character, then it will be printed in single width.

SINGLE WIDTH (1FH) Reverts to single width printing. Single and double width can be combined anywhere on a line.

NOTE :- 560 GRAPHICS COMMAND

ESC K n1, n2, (1BH,4BH n1, n2)

This command requires special note because all associated data will be ignored. The number of graphics bytes determined by n1 and n2, will be received but discarded so as not to appear as erroneous text.

Note that n1 can only be up to 240 and n2 will be read as zero as the 560 only allows printing of 240 graphics bytes. If more than 240 graphics characters are sent, then the balance will be interpreted as non-graphic data.

3.5 Specification

Power Supply : Internal Ni-Cad batteries.
Text can be printed continuously for approximately 1 hour when the batteries are fully charged.
It will take 14 hours (without printing) to totally charge the batteries.

Adapter Specification - See Appendix 3.

A power saving feature automatically switches the printer off when the interface has not been used for a 1 or 5 minute (programmable) period.
A continuous power-on option is available.
(See section 1.5).

Mechanism : EPSON M100 impact printer series.

Character Set : Full international character sets plus additional European and scientific characters. (See Appendices 1 and 2).

Matrix : 5 X 7 dots.

Buffer : 1 character line.

	1009	**1012**	**1014**
Graphics Char.	42	24	40
Resolution (Dots/mm)	5	3	5
Print Speed (Lines/sec)	1.0	2.5	1.7
Character Size (mm)	1.1 (w) x 2.6 (h)	1.7 (w) x 2.6 (h)	1.1 (w) x 2.6 (h)
MCBF (lines)	500,000	1,500,000	900,000

Interface : Centronics Parallel or RS232 Serial.

Environment : Operating Temperature 0 to 40 deg C.
Storage Temperature -25 to 40 deg C.
Operating Humidity 10% to 85% (Non-Condensing).
Storage Humidity 10% to 90% RH (Non-Condensing).

Dimensions : 209mm (l) X 106mm (w) X 93mm (h)

APPENDIX 1

Character Set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	`	p	Ç	É	á	!	.	J	"	/
1			!	1	A	Q	a	q	ü	æ	í	"	2	L	ß	±
2			"	2	B	R	b	r	é	Æ	ó	#	0	H	'	$
3			#	3	C	S	c	s	â	ô	ú	*	/	F	B	#
4		DC4	$	4	D	T	d	t	ä	ö	ñ	1	)	B	E	!
5			%	5	E	U	e	u	à	ò	Ñ	I	3	?	F	"
6			&	6	F	V	f	v	å	û	o	M	G	C	:	÷
7			'	7	G	W	g	w	ç	ù	º	D	K	O	J	.
8			(	8	H	X	h	x	ê	ÿ	¿	@	9	P	M	°
9		CAN	)	9	I	Y	i	y	ë	Ö	1	<	6	-	1	@
A	LF		*	:	J	Z	j	z	è	Ü	¬	5	=	+	S	A
B		ESC	+	;	K	[	k	{	ï	¢	½	7	;	$	*	%
C	FF		,	<	L	\	l	|	î	£	¼	8	:	(	4	6
D	CR		-	=	M	]	m	}	ì	¥	¡	E	4	%	N	2
E	S0		.	>	N	^	n	~	Ä	.	«	A	>	'	,	#
F			/	?	O	_	o	-	Å	ƒ	»	,	N	&	1	SP

SP indicates a space character. Blank locations indicate unused codes.

APPENDIX 2

International Character Set

	n	35_D 23_H	36_D 24_H	64_D 40_H	91_D $5B_H$	92_D $5C_H$	93_D $5D_H$	94_D $5E_H$	96_D 60_H	123_D $7B_H$	124_D $7C_H$	125_D $7D_H$	126_D $7E_H$
U.S.A.	0	#	$	@	[	\	]	^	`	{	|	}	~
FRANCE	1	#	$	à	°	ç	§	^	`	é	ù	è	"
GERMANY	2	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
U.K.	3	£	$	@	[	\	]	^	`	{	|	}	~
DENMARK I	4	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
SWEDEN	5	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
ITALY	6	#	$	@	°	\	é	^	ù	à	ò	è	i
SPAIN	7	₧	$	@	i	Ñ	¿	^	`	"	ñ	}	~
JAPAN	8	#	$	@	[	¥	]	^	`	{	|	}	~
NORWAY	9	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
DENMARK II	10	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

APPENDIX 3

Power Supply Adapter Specification - 1000 Series/1200 series

Mechanical

Enclosure manufactured from V0 rated plastic
Shrouded mains pins as part of enclosure
Flying lead for output voltage 2m --> 3m long
Termination by d.c. jack plug, outer diameter 5.5mm, inner diameter 2.5mm, length 9.5mm (US versions use a 2.1mm inner diameter).
Inner connection - positive supply
Outer connection - negative supply

Standards

Should be VDE, UL or BS415 and BS7002 approved.

With Internal Batteries

Either 1. 12V regulated 600mA supply capable of supplying 2A peaks.
2. 9V unregulated 600mA supply capable of supplying 2A peaks.

Without Internal Batteries (Only available as an option with the 1000 series)

Either 1. 12V regulated 1.3A supply capable of supplying 4A peaks.
2. 9V unregulated 1.3A supply capable of supplying 4A peaks.